Ferdinand Bertram
1894—1960

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Dr. Ferdinand Bertram died in Hamburg on Oct. 28, 1960, at the age of sixty-six. He was one of the most prominent German specialists in diabetes and played a leading role in the development of the modern therapy of diabetes.

Dr. Bertram was born in Hamburg on Jan. 3, 1894. After completing his studies in Natural Sciences and Medicine at the Universities of Marburg and Hamburg, he worked for a few years as Assistant in the Institute of the famous Hamburg physiologist and pharmacologist Bornstein. In his first publication in 1923 he dealt with problems of blood sugar regulation. In 1925 Dr. Bertram began to work as a clinician. In 1932 he became a lecturer and then Assistant Professor in the Medical Faculty of the University of Hamburg. At the same time he became the director of the II. Medical Clinic of the Hamburg-Barmbek Hospital, which became a widely known model diabetes clinic within a few years under his vigorous directorship.

Dr. Bertram's scientific work was centered on the therapeutic problems of diabetes mellitus. In 1925 he reported his investigations with insulin-protein mixtures in the *Klinische Wochenschrift.* He found that the effect of insulin could be enhanced and prolonged by the addition of protein, and in this way described the principle of action of "depot" insulin for the first time a decade before Hagedorn.

In 1927 he was one of the first in Germany to object to the very high fat and low carbohydrate diabetic diets which were generally accepted at that time. This unphysiological form of nutrition was developed in the preinsulin era, and was continued even with insulin therapy in spite of the fact that it was fundamentally out of date. It is hardly comprehensible today that Dr. Bertram with his postulate that diabetics should be given more carbohydrate and less fat, was strongly opposed for many years. Ignoring this opposition, in the following years Dr. Bertram developed a diet with less fat and richer in carbohydrates. He did not have to wait long for success: There were no more cases of ketonemia. His "modern diabetes therapy" succeeded gradually. It was proved to be right in the years 1943 to 1948 when the German people were nourished with a minimum of fat and protein but just enough carbohydrate. Diabetes in Germany had never before appeared so easy and uncomplicated as in those years. Today, a diet relatively rich in carbohydrate and poor in fat which is the optimal nutrition for diabetics, is generally accepted in Germany, and is a conditio sine qua non for the prevention of ketonemia, arteriosclerosis and the specific diabetic vascular complications.

From 1927 to 1930 Dr. Bertram worked extensively on the mode of action and the clinical application of Synthalin and other blood-sugar reducing guanidine derivatives. He was awarded the Dr. Martini prize of Hamburg University for his investigations. As is well known, the trial of oral diabetes treatment was soon given up at that time, partly as a result of his objections.

Almost thirty years later the successful clinical trial of the new oral "antidiabetic" drugs became the highlight of his career. In 1955—after the early death of Dr. Franke of Berlin, the inaugurator of the oral therapy of diabetes—Dr. Bertram worked out the clinical foundations of treatment with the sulfonylurea drugs. On Oct. 4, 1955, in a lecture given to the German Society for Digestive and Metabolic Diseases, and at the same time in a publication in the *Deutsche Medizinische Wochenschrift,* he reported the treatment of diabetes with sulfonylurea derivatives for the first time. In this first paper, all the essential points were mentioned concerning the clinical application of these drugs and the indications and the expectations of success in the different types of diabetes. In the following years Dr. Bertram's findings were confirmed everywhere and the details were completed.

Dr. Bertram's book *Die Zuckerkrankheit (Diabetes)* has been the standard work on diabetes in the German language since 1934. He also wrote the chapter on clinical diabetes in the new edition of Thannhauser's *Textbook of Metabolism and Metabolic Diseases* which is now also available in English. The *ABC für Zuckerkranke (ABC for Diabetics)*, which he wrote twenty years ago for his patients, is the most widely distributed book of information for diabetics in German. The tenth edition of this book, which is the last

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but one, he dedicated to Dr. Joslin, his respected friend for many years, for his ninetieth birthday.

In May 1960 Dr. Bertram directed the International Biguanide Symposium at Aachen, Germany, with great vitality. A few days later he was obliged to go to bed with a severe illness.

In spite of this he still found the strength to make a complete revision of his textbook on diabetes for the new, fifth edition. He died on October 28 after a full life, and friends, colleagues and diabetic patients gave him the last words of appreciation and gratitude at his funeral.

ABSTRACTS

Appelman, David H. (Diabetes Clinic, Jewish Chronic Disease Hosp.; & Endocrinology Clinic & Dept. of Med., Beth-El Hosp., Brooklyn, N. Y.): KIMMELSTIEL-WILSON SYNDROME. New York J. Med. *61*:1518-22, May 1, 1961.

The author reviews present-day knowledge regarding the Kimmelstiel-Wilson syndrome, with special attention to and discussion of pathology, experimental production of lesions of diabetic glomerulosclerosis, the specific vascular lesion of diabetes, and the complication of nephrotic syndrome which may develop. Prognosis and treatment are also reviewed. C.A.R.

Arney, Glen K.; Pearson, Elinor; and Sutherland, Anne B. (U. S. Army Surg. Res. Unit, Brooke Army Med. Center, Fort Sam Houston, Tex.): BURN STRESS PSEUDODIABETES. Ann. Surg. *152*:77-90, July 1960.

Two patients exhibited hyperglycemia, glycosuria and marked dehydration following severe third-degree burns. In one case, impaired glucose tolerance returned to normal after recovery. Dehydration was primarily due to glycosuria and diuresis, and was accompanied by elevation of the nonprotein nitrogen, hemoglobin and hematocrit, serum sodium and chloride. Hyperglycemia was related to adrenal cortical hormone release, in the presence of forced feeding and dehydration. Five of eight other patients having hyperglycemia following burns were noted to have a family history of diabetes. The mechanism of the pseudodiabetes involved diminished peripheral insulin effect or impaired insulin secretion. A.R.C., Jr.

Axelsson, J.; Bueding, E.; and Bülbring, Edith (Dept. of Pharmacol., Univ. of Oxford, Oxford, England): THE INHIBITORY ACTION OF ADRENALINE ON INTESTINAL SMOOTH MUSCLE IN RELATION TO ITS ACTION ON PHOSPHORYLASE ACTIVITY. J. Physiol. *156*:357-74, April 1961.

The action of adrenalin on smooth muscle was studied in tenia coli of guinea pigs. In Ringer's solution containing glucose, adrenalin caused hyperpolarization of the cell membrane, stopped spontaneous spike activity, and abolished the conducted response to electrical stimulation. Adrenalin increased the phosphorylase activity of the smooth muscle. As the glycogen content of the tissue became depleted during incubation in glucose-free medium, the effect of adrenalin on the cell membrane became gradually less; after marked depletion of glycogen, the effect of adrenalin was reversed — it caused depolarization and initiated spikes. It is suggested that adrenalin may have opposite effects upon the cell membrane depending upon whether or not sufficient glycogen is present to act as a source of additional energy. H.T.N.

Baker, R. David; Searle, Gordon W.; and Nunn, Arthur S. (Dept. of Physiol., Coll. of Med., State Univ. of Iowa, Iowa City, Ia.): GLUCOSE AND SORBOSE ABSORPTION AT VARIOUS LEVELS OF RAT SMALL INTESTINE. Am. J. Physiol. *200*: 301-04, February 1961.

The passage of glucose and sorbose across the wall at various levels of rat small intestine has been studied in vitro. "Uphill" glucose transport was demonstrated in the jejunum and upper half of the ileum but could not be seen in the terminal quarter of small intestine. Aerobically, in the mid-jejunum glucose absorption from the mucosal solution was about 5.5 times as rapid as in the terminal ileum; the aboral decline in absorptive activity, however, occurred only in the lower half of the small intestine; the upper half absorbed glucose at a nearly constant rate throughout. No aboral decline for rate of glucose transfer into the serosal solution was noticed in the upper three-quarters of small intestine, but in the lower quarter the drop was precipitous.

The effects of hypoxia and fluoride poisoning on glucose movements were much more severe in the upper than in the lower portions of small intestine. Fluoride (48 mM) completely abolished the absorptive activity gradient for glucose along the small intestine. Movements of sorbose, which is passively absorbed, were quite similar in rate to the fluoride-inhibited glucose movements.

These observations indicate that the intestinal absorption gradient for glucose probably results from the relative distribution along the intestine of the same rate-limiting component of the active transport system for glucose. L.S.S.

Bassett, E. W.; Beiser, S. M.; and Tanenbaum, S. W. (Dept. of Microbiology, Coll. of Physicians and Surgeons, Columbia Univ., New York, N. Y.): PURIFICATION OF ANTIBODY TO GALACTOSYL-PROTEIN CONJUGATES. Science *133*:1475-76, May 12, 1961.

A rapid procedure for purification of rabbit antibody to B-D-galactosylphenylazo-bovine serum albumin is described. Antibody was precipitated with a heterologous antigen and was then dissociated from the precipitated complex with hapten. The antigen was partially removed by *p*H adjustment, and antibody was separated from residual antigen and from hapten by partition chromatography on Sephadex G-25. The antibody, obtained in 50 to 55 per cent over-all yield, was 96 per cent reactive with homologous antigen. It appeared to consist of 95 per cent of a single component, based upon physicochemical measurements. L.S.S.